

REVISIONS																			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED																
A	Updated drawing to reflect MIL-H-38534 processing. Editorial changes throughout.	91-12-10	<i>Alan Osborne</i>																

CURRENT CAGE CODE 67268

REV																			
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REV STATUS OF SHEETS	REV	A	A	A	A	A	A	A	A	A						
	SHEET	1	2	3	4	5	6	7	8							

PMIC N/A	PREPARED BY Donald R. Osborne	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444		
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY Dan A. DiCenzo	MICROCIRCUIT, LINEAR, WIDE BAND POWER OPERATIONAL AMPLIFIER, THICK FILM HYBRID		
	APPROVED BY Nelson A. Hauch			
	DRAWING APPROVAL DATE 85-10-21	SIZE A	CAGE CODE 14933	85089
	REVISION LEVEL A	SHEET 1 OF 8		

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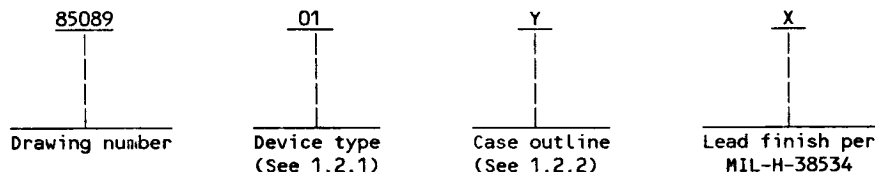
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5962-E391

1. SCOPE

1.1 Scope. This drawing describes device requirements for class H hybrid microcircuits to be processed in accordance with MIL-H-38534.

1.2 Part or Identifying Number (PIN). The complete PIN shall be as shown in the following example:



1.2.1 Device type(s). The device type(s) shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	LH0101A	Power operational amplifier
02	LH0101	Power operational amplifier

1.2.2 Case outline(s). The case outline(s) shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
Y	T0-3 (8 Lead can), see figure 1

1.3 Absolute maximum ratings.

Supply voltage - - - - -	±22 V dc
Input voltage- - - - -	±20 V dc but ≤ ±V _S
Power dissipation <u>1/</u> - - - - -	5 W
Power dissipation <u>2/</u> - - - - -	62 W
Differential input voltage - - - - -	±40 V dc but ≤ ±V _S
Peak output current (50 ms pulse)- - - - -	5 A
Output short circuit duration <u>3/</u> - - - - -	Continuous
Storage temperature range- - - - -	-65°C to +150°C
Lead temperature (soldering, < 10 sec) - - - - -	300°C
Thermal resistance:	
Junction-to-case (Θ _{JC}) - - - - -	2°C/W
Junction-to-ambient (Θ _{JA}) - - - - -	+150°C
Junction temperature range (T _J) - - - - -	-55°C to ±125°C

1.4 Recommended operating conditions.

Ambient operating temperature range- - - - -	-55°C to ±125°C
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1/ T_A = 25°C. Derate linearly at 25°C/W to 0 at 150°C.

2/ T_C = 25°C. Derate linearly at 2°C/W to 0 at 150°C.

3/ T_A = 25°C, R_{SC} = 0.35Ω. Rating applies as long as package power dissipation is not exceeded.

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2. APPLICABLE DOCUMENTS

2.1 Government specifications and standard. Unless otherwise specified, the following specifications and standard of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATIONS

MILITARY

- MIL-M-38510 - Microcircuits, General Specification for.
- MIL-H-38534 - Hybrid Microcircuits, General Specification for.

STANDARD

MILITARY

- MIL-STD-883 - Test Methods and Procedures for Microelectronics.

(Copies of the specifications and standard required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with MIL-H-38534 and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-H-38534 and herein.

3.2.1 Case outline(s). The case outline(s) shall be in accordance with 1.2.2 herein.

3.2.2 Terminal connections. The terminal connections shall be as specified on figure 2.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and shall apply over the full specified operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-H-38534. The part shall be marked with the PIN listed in 1.2 herein. In addition, the manufacturer's PIN may also be marked as listed in QML-38534 (see 6.6 herein).

3.6 Manufacturer eligibility. In addition to the general requirements of MIL-H-38534, the manufacturer of the part described herein shall submit for DESC-ECT review and approval electrical test data (variables format) on 22 devices from the initial quality conformance inspection group A lot sample, produced on the certified line, for each device type listed herein. The data should also include a summary of all parameters manually tested, and for those which, if any, are guaranteed.

3.7 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in QML-38534 (see 6.6 herein). The certificate of compliance submitted to DESC-ECT prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-H-38534 and the requirements herein.

3.8 Certificate of conformance. A certificate of conformance as required in MIL-H-38534 shall be provided with each lot of microcircuits delivered to this drawing.

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TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions $-55^{\circ}\text{C} \leq T_A \leq +125^{\circ}\text{C}$ unless otherwise specified	Group A subgroups	Device type	Limits		Unit
					Min	Max	
Input offset voltage	V_{IO}	$T_A = 25^{\circ}\text{C}$ $T_A = 25^{\circ}\text{C}$	1 1 2,3 2,3	01 02 01 02		3 10 7 15	mV
Input bias current	I_{IB}	$T_A = 25^{\circ}\text{C}$ $T_A = 25^{\circ}\text{C}$	1 1 2,3 2,3	01 02 01 02		300 1000 300 1000	pA pA nA nA
Input offset current	I_{IO}	$T_A = 25^{\circ}\text{C}$ $T_A = 25^{\circ}\text{C}$	1 1 2,3 2,3	01 02 01 02		75 250 75 250	pA pA nA nA
Large signal voltage gain	A_{VOL}	$V_O = \pm 10 \text{ V}$, $R_L = 10\Omega$	1	ALL	50		V/mV
Output voltage swing	V_O	$R_{SC} = 0\Omega$, $A_V = 1$, $R_L = 100\Omega$ $R_{SC} = 0\Omega$, $A_V = 1$, $R_L = 10\Omega$	1 1	ALL ALL	± 11.7 ± 11		V
Common mode rejection ratio	CMRR	$V_{IN} = \pm 10 \text{ V}$	1	ALL	85		dB
Power supply rejection ratio	PSRR	$\pm 5 \text{ V} \leq V_S \leq \pm 15 \text{ V}$	1	ALL	85		dB
		$+5 \text{ V} \leq V_{S(+)} \leq +15 \text{ V}$, $V_{S(-)} = -15 \text{ V}$	1	ALL	80		dB
		$-5 \text{ V} \geq V_{S(-)} \geq -15 \text{ V}$, $V_{S(+)} = +15 \text{ V}$	1	ALL	80		dB
Supply current	I_S		1	ALL		35	mA
Slew rate	SR	$R_L = 10\Omega$, $A_V = 1$	1	01	7.5		V/ μs
Gain-bandwidth product	GBW	$R_L = \infty$, $A_V = 1$	1	01	4		MHz

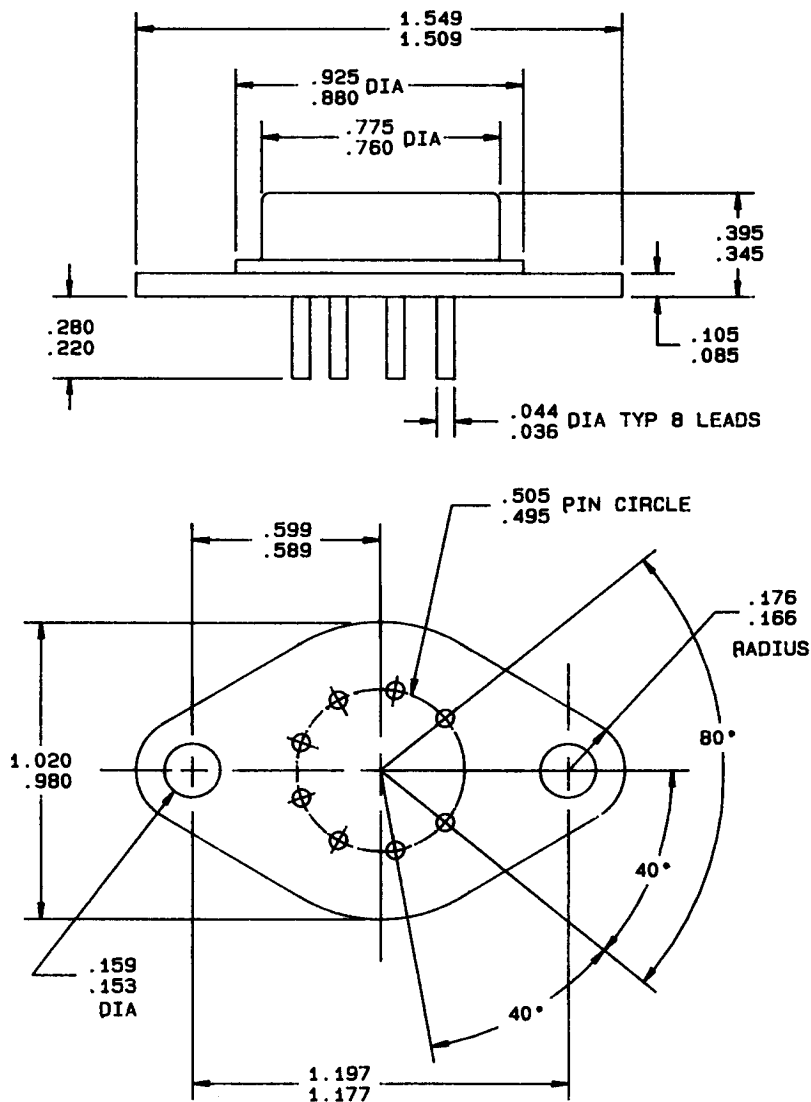
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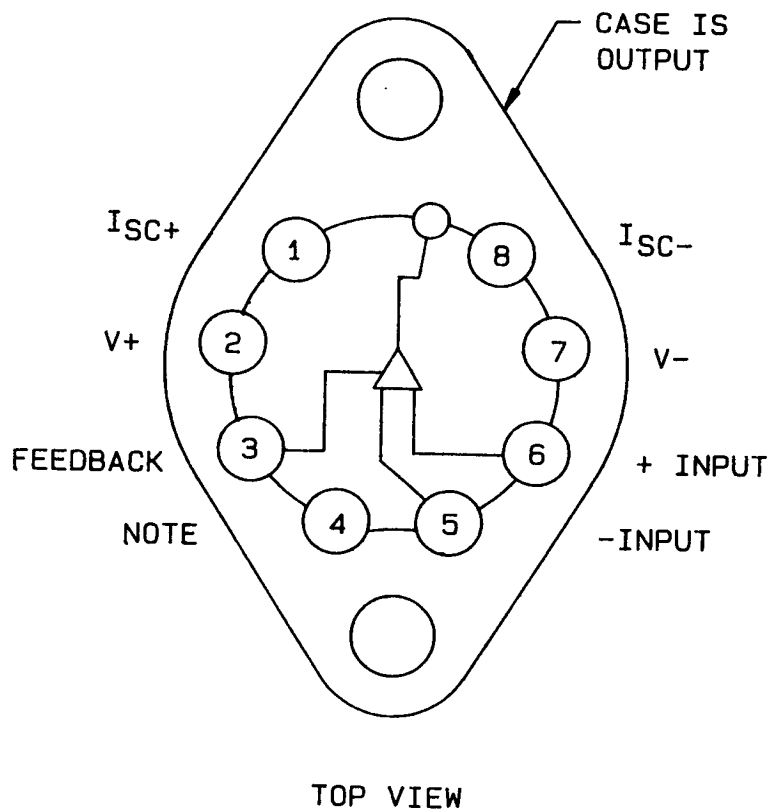
SHEET
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Inches	mm
.036	0.92
.044	1.12
.085	2.16
.105	2.66
.153	3.89
.159	4.04
.166	4.22
.176	4.47
.220	5.59
.280	7.11
.345	8.76
.395	10.03
.495	12.57
.505	12.83
.589	14.96
.599	15.22
.760	19.30
.775	19.69
.880	22.35
.925	23.50
.980	24.89
1.020	25.91
1.177	29.90
1.197	30.40
1.509	38.33
1.549	39.35

FIGURE 1. Case outline.

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NOTE: Pin 4 is electrically connected internally.
No connection should be made to pin.

FIGURE 2. Terminal connections.

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TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5008, group A test table)
Interim electrical parameters	---
Final electrical test parameters	1*,2,3,4
Group A test requirements	1,2,3,4
Group C end-point electrical parameters	1,2,3

* PDA applies to subgroup 1.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with MIL-H-38534.

4.2 Screening. Screening shall be in accordance with MIL-H-38534. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.7 herein).

(2) T_A as specified in accordance with table I of method 1015 of MIL-STD-883.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with MIL-H-38534 and as specified herein.

4.3.1 Group A inspection. Group A inspection shall be in accordance with MIL-H-38534 and as follows:

a. Tests shall be as specified in table II herein.

b. Subgroups 5, 6, 7, 8, 9, 10 and 11 shall be omitted.

4.3.2 Group B inspection. Group B inspection shall be in accordance with MIL-H-38534.

4.3.3 Group C inspection. Group C inspection shall be in accordance with MIL-H-38534 and as follows:

a. End-point electrical parameters shall be as specified in table II herein.

b. Steady-state life test conditions, method 1005 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.7 herein).

(2) T_A as specified in accordance with table I of method 1005 of MIL-STD-883.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

4.3.4 Group D inspection. Group D inspection shall be in accordance with MIL-H-38534.

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5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-H-38534.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for original equipment design applications and logistic support of existing equipment.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by a contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECT, telephone (513) 296-6047.

6.5 Comments. Comments on this drawing should be directed to DESC-ECT, Dayton, Ohio 45444, or telephone (513) 296-5374.

6.6 Approved sources of supply. Approved sources of supply are listed in QML-38534. Additional sources will be added to QML-38534 as they become available. The vendors listed in QML-38534 have agreed to this drawing and a certificate of compliance (see 3.7 herein) has been submitted to and accepted by DESC-ECT.

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